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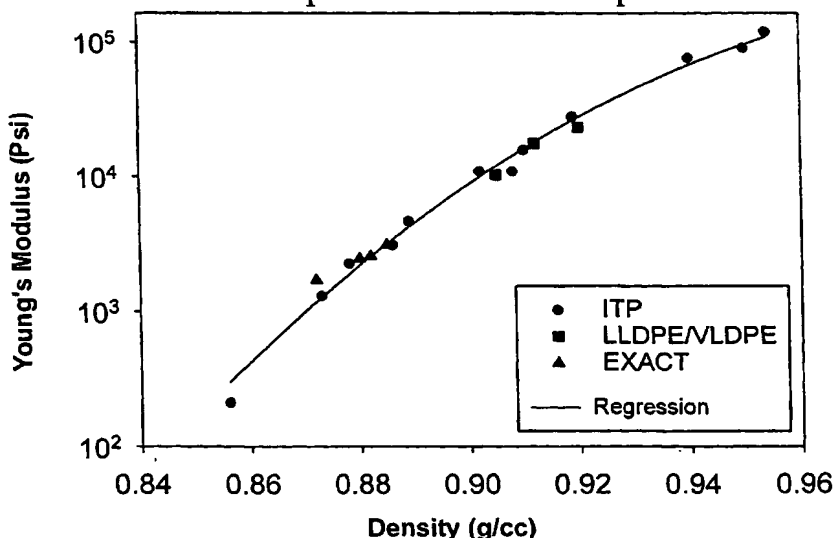
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[Continued on next page]

(54) Title: HIGH CLARITY, HIGH STIFFNESS FILMS

## Modulus vs. Density of Polyethylenes

### Compression Molded Plaques



$$\text{Log}(\text{Modulus}) = -130.0787 + 270.267 \cdot \text{den} - 134.832 \cdot \text{den}^2, r^2 = 0.99$$

(57) Abstract: A multi-layer heat film having at least three layers is disclosed wherein the film has high optical properties, high stiffness and desirable shrinkage in the cross direction. The inner layer, or layers, comprises at least one stiffening polymer selected from the group consisting of: low density polyethylene, linear low density polyethylene, high density polyethylene, blends thereof, polypropylene random copolymer, styrene/butadiene copolymer, polystyrene, ethylene-vinyl acetate copolymer and cyclic-olefin copolymer, provided that when more than one inner layer is present, the inner layers can be the same or different. The skin layers, which may be the same or different, comprise at least one of: low density polyethylene; a blend of low density polyethylene and linear low density polyethylene; a blend of low density polyethylene and very low density polyethylene;

polystyrene; ethylene-vinyl acetate copolymer; a blend of ethylene-vinyl acetate copolymer and linear low density polyethylene; cyclic-olefin copolymer; styrene-butadiene copolymer; or, polypropylene random copolymer, provided that the skin layers are devoid of a homogeneously branched polyethylene resin prepared with a single site catalyst. The inventive films have haze values of less than about 15%, a 2% secant modulus greater than about 50,000 psi and a cross directional shrinkage greater than 0%. The inventive films are made by a process that does not include post-extrusion bi-axial orientation.



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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# INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**  
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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 B32B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/046606 A1 (KAARTO JOHN ET AL) 29 November 2001 (2001-11-29) claims 1,18-21 page 1, paragraph 9 - paragraph 11 page 2, paragraph 18 page 2, paragraph 24 - paragraph 25 page 6, paragraph 53 page 6, paragraph 61 -page 7, paragraph 68 page 8, paragraph 72 - paragraph 77 examples A,B,C; tables 1-3  <div style="text-align: center;">--- -/-</div>	1-48

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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X	EP 0 388 177 A (GRACE W R & CO) 19 September 1990 (1990-09-19) claims 1,4,5,8,9 page 2, column 1, line 1 - line 5 page 5, column 7, line 43 - column 8, line 54 page 6, column 9, line 2 - line 8 example 1 ---	1-48
X	WO 01 10643 A (BANASZAK CHERYL M ;BUCCULO ADAM D (US); CHILDRESS BLAINE C (US); S) 15 February 2001 (2001-02-15) claims 1,5,6,8,12-14 page 7, line 29 -page 9, line 15 tables 2-5 page 19, line 6 - line 19 page 21, line 12 - line 33 ---	1-48
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